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otvetstvennyy redaktor; RAZUMOVA, L.L., redaktor; ZEMLYAKOVA, T.A.,
tekhnicheskiiy redaktor

[Problems pertaining to the structure of silica glass] Voprosy
struktury silikatnykh stekol. Moskva, Izd-vo Akademii nauk SSSR,
1954. 191 p. (MIRA 8:3)
(Glass)

SHISHAKOV, N. A.

USSR/ Chemistry - Physical chemistry

Card 1/1 Pub. 147 - 19/22

Authors : Shishakov, N. A.

Title : Crystal and melted quartz mosaic blocks

Periodical : Zhur. fiz. khim. 29/11, page 2096, Nov 1955

Abstract : The dimensions of crystalline quartz particles and particles of melted quartz obtained as result of peptization with water and left in a suspended state in water for three months were measured by means of an electron microscope. The particle dimensions were found to vary from 500 to 2000 Å. Experiments showed that mosaic blocks made of crystalline and melted quartz do not have an organ pipe supporting structure as in the case of other real crystals. The microcracks observed in these crystals, which characterize the properties of quartz, have an orderless orientation. Two USSR references (1938-1954). Illustrations.

Institution : Acad. of Scs., USSR, Inst. of Phys. Chem., Moscow

Submitted : June 22, 1955

Shishakov, N.A.

70-5-20/31

AUTHOR: Shishakov, N.A.

TITLE: On the Structure of the Oxide Au_3O_2 (C structure okisi Au_3O_2)

PERIODICAL: Kristallografiya, 1957, Vol.2, No.5, pp. 686-688 (USSR)

ABSTRACT: Gold was heated to 500 °C in oxygen and the oxidised surface resulting was examined in an electron diffraction pattern. Patterns showing an oriented texture with a total of 15 spacings could be recorded (listed). Inversion of the data gave a radial density distribution curve with peaks at 1.4, 2.5, 3.7, 4.8 and 5.7 Å. The first peak is due to series termination effects and the 3.7 peak represents Au-Au vectors. The diffraction effects can be explained in terms of a hexagonal structure of formula Au_3O_2 with $a = 5.28$ and $c = 6.75$ Å, $Z = 2$ and calculated density 6.4. Reflections are absent if for hkl , $l = 2n + 1$ and for the class hkl if $h - k = 3n$ and $l = 2n$. Satisfactory intensity agreement is obtained. Analogous compounds are formed on Ag and Cu. There are 4 figures, 1 table and 2 references, 1 of which is cited.

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001549530012-1

ASSOCIATION: Institute of Physical Chemistry Ac.Sc. USSR
(Institut Fizicheskoy Khimii AN SSSR)

The Structure of the Oxide Au_3O_2 .

70-5-20/31

DEPOSITED: April 18, 1957.

AVAILABLE: Library of Congress.

Part 2/2

Shishakov, N.A.
AUTHOR: Shishakov, N.A.

70-5-21/31

TITLE: On the Structure of the Oxide PtO_2 (O strukture okisi PtO_2)

PERIODICAL: Kristallografiya, 1957, Vol.2, No.5, pp. 689-690 (USSR)

ABSTRACT: Inversion of electronographic data obtained earlier by Finch et al. (PRS, 141A, 414, 1933) gives a radial distribution curve for PtO_2 with peaks corresponding to interatomic vectors at 1.9, 3.1, 4.8 and 5.6 Å. These can be explained in terms of a hexagonal unit cell with $a = 3.1$ and $c = 4.8$ Å and $Z = 1$. The Pt atom is at (0, 0, 0) and the oxygen at 1.9 Å from it at $(\bar{x}, x, 1/3)$. Only hko reflections are observed which may indicate a defect lattice. There are 2 figures, 2 tables and 2 references, of which 1 is Slavic.

ASSOCIATION: Institute of Physical Chemistry Ac.Sc. USSR
(Institut Fizicheskoy khimii AN SSSR)

SUBMITTED: April 24, 1957.

AVAILABLE: Library of Congress.
Card 1/1

SHISHAKOV, N. A.

126-1-28/40

AUTHOR: Shishakov, N. A.

TITLE:

On the anomalous structure of iron crystals obtained at the initial stage of condensation from vapour.
(Ob anomal'nom stroyenii kristallov zheleza, poluchayushchikhsya na nachal'noy stadii kondensatsii iz para).

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol.5, No.1, pp. 169-171 (USSR)

ABSTRACT: In earlier work (Ref.1) the author observed that small metal crystals frequently have an increased lattice constant and the assumption was expressed that this phenomenon is caused by a reduced density of the electron liquid near to the surface of the crystals and consequently also by a weakening of the bonds between the atoms. This conception is confirmed by the results of another experiment in which very thin films of iron obtained by condensation of iron vapours on thin films of cellulose and mica in a good quality vacuum inside the electron diffraction camera itself were investigated by means of electron diffraction. The process of condensation could easily be followed from the diffraction patterns on a fluorescent screen; the first instant of condensation

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On the anomalous structure of iron crystals obtained at the initial stage of condensation from vapour.

is of primary interest; this is characterised by the formation of a picture with extensively widened diffraction rings which were reproduced on a number of photographs. On the basis of accurate measurements the constant of the cubic lattice was found to equal 3.00 Å, i.e. 5% higher than the normal constant of 2.86 Å. Careful investigation indicated, however, that the lattice is not really cubic but it is rather hexagonal and has a constant of $a = 2.45$ Å. This is confirmed by the microphotographic curve, Fig.1, which was derived from the electron diffraction picture for the initial stage of crystallisation and from the data entered in the table, p.170, in which the intensity values of the first four lines of the cubic lattice of iron, obtained by differing methods, are compared with the intensities determined from the microphotometric curve. The obtained results are discussed and explained. It is stated that the cause of the non-uniform distances can be the differing magnitude of the metallic bond at various depths of the crystal and consequently also the differing degree of ionisation of the atoms or a differing density of the electron liquid.

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On the anomalous structure of iron crystals obtained at the initial stage of condensation from vapour.

It is particularly this weakening of the bond between the atoms which is likely to be the cause of the widened state of the lattice of the metals which, in the given case, reaches 5%. Of great interest is, for instance, the cessation of certain characteristic reflections observed earlier by Germer, L. and White, A.A. (ref.3) on gold and copper, which indicates that this relation has a general character. A more detailed communication, which will include information on the size and shape of the crystals and of certain details of the structure, will be published separately. There are 1 figure, 1 table and 3 references, two of which are Slavic.

SUBMITTED: November 27, 1956.

ASSOCIATION: Institute of Physical Chemistry, Ac.Sc. USSR.
(Institut Fizicheskoy Khimii, AN SSSR).

AVAILABLE: Library of Congress.

Card 3/3

SHISHAKOV, N. A.

USSR/Solid State Physics - Structural Crystallography

E-3

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 919

Author : Shishakov, N. A.

Inst : Institute of Physical Chemistry, Academy of Sciences,
USSR, Moscow.

Title : Investigation of the Atomic-Molecular Structure of Certain
Oxides by the Radial-Distribution Method.

Orig Pub : Zh. fiz. khimii, 1957, 31, No 1, 33-41

Abstract : The radial-distribution method jointly with the Mackle and
Sutton formula (Mackle H., Sutton L., Transactions of the
Faraday Society, 1937, 47, 691, 951) have been used to in-
vestigate the structure of the following oxide and hydroxi-
de compounds: γ -AlOOH, σ -AlOOH, β -Mg(OH)₂,
 δ -FeOOH, AuO₆, and also of the primary oxide film on alu-
minum. For the first four hydroxides, the values of the

Card 1/2

AUTHOR: Shishakov, N. A. 76-32-5-38/47

TITLE: The Structure of the Oxygen Film on Metals and Its Role in the Oriented Growth of Oxide Films (Stroyeniye kislородnoy plenki na metallakh i yeye rol' v oriyentirovannom roste okisnykh plenok)

PERIODICAL: Zhurnal fizicheskoy Khimii, 1958, Vol. 32, Nr 5, pp.1171-1171 (USSR)

ABSTRACT: The many times observed oxide films on metals can be explained by the formation of a regulated polymolecular adsorption of oxygen, the character of the regulation being evaluated according to the texture of hematite crystals on iron. The essential differences of the thickness of the oxide layers in electrographical data observed in vacuum and according to known optical measurements in the air, and according to latest measurements amounting to from 10 to 30 Å in various metals, point at this reversible polymolecular oxygen adsorption. Structural observations show that on a heating in oxygen up to 200°C on gold and up to 300°C on platinum only one period analogous to the layers of fatty acids is observed, while

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The Structure of the Oxygen Film on Metals and Its Rôle in the Oriented Growth of Oxide Films

76-32-5-38/47

other periods occur only on a rise of temperature; in this connection it was also found that in the latter case also gold oxides contain a molecular O_2^{--} -ion. It is assumed that the oxygen molecules in such structures with their great axes are located normally to the foundation surface, probably according to the law of tighter packings, with the formation of these structures being explained by an impinging of metal ions into the oxygen surface layer. The apparent dissolution of oxygen in platinum and other metals on heating can be assumed to be a dissolution of the metal in the oxygen layer. The diffusion of the cations by the layer can be explained by the presence of noticeable potential differences between the differently charged surface layer of the metal and of the oxygen layer located above it. There are 3 references, 3 of which are Soviet.

ASSOCIATION: Akademiya nauk SSSR Institut fizicheskoy khimii, Moskva (Moscow, Institute of Physics and Chemistry, AS USSR)

SUBMITTED: June 15, 1957

Card 2/2

1. Oxygen films--Structural analysis
2. Oxide films--Growth
3. Metals--Oxidation
4. Oxygen--Adsorption

AUTHORS: Andreyeva, V. V., Shishakov, N. A. SOV/76-32-7-35/45

TITLE: On the Thickness of Oxide Films on Some Metals as Shown by Data From Electron Diffraction and Optical Investigations (O tolshchine okisnykh plenok na nekotorykh metallakh po dannym elektronograficheskikh i opticheskikh issledovaniy)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 7, pp 1671 - 1672 (USSR)

ABSTRACT: Based on the comparative investigations mentioned above it is assumed that a reversible polymolecular adsorption takes place at metal surfaces besides the monomolecular adsorption. In the electron diffraction determinations in vacuum a thickness of the layer of from 10 to 20 Å is found, while the optical measurements yield an almost twice as great value. In the first case, therefore, a partial evaporation of the film may have taken place, which in the second case is regarded as oxide film. In order to verify this assumption pertinent experiments were carried out and it was found that in aluminium electron diffraction measurements show a layer of aluminium and oxygen ions which is not thicker than 10 Å, while optical data in the case

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On the Thickness of Oxide Films on Some Metals as SOV/76-32-7-35/45
Shown by Data From Electron Diffraction and Optical Investigations

of an air contact of the aluminium surface show a thickness of 21 - 22 Å. In the first case it would thus be the oxide film which is dealt with, while in the second case the oxide film and the polymolecular layer are present, which probably consists of oxygen and water traces. In the case of a pressure drop to 10^{-7} torr the film thickness decreases to 9 Å. When atmospheric pressure is restored it increases reversibly. Similar observations were made with iron and titanium, while experiments with platinum and gold showed that at normal temperature only the adsorption layer is present which completely disappears in vacuum, so that no film layer may be found by electron diffraction methods. At raised temperatures oxide films were also found in vacuum and it is assumed that this is an adsorption layer of molecular oxygen. There are 1 table and 3 references, 3 of which are Soviet.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii, Moskva (Moscow, Institute of Physical Chemistry, AS USSR)

Card 2/3

On the Thickness of Oxide Films on Some Metals as SOV/76-32-7-35/45
Shown by Data From Electron Diffraction and Optical Investigations

SUBMITTED: April 2, 1957

1. Oxide films--Physical properties
2. Oxide films--Measurement
3. Oxide films--Electron diffraction analysis
4. Oxide films
--Optical analysis
5. Metals--Adsorptive properties

Card 3/3

5(4), 18(3)
AUTHOR:

Shishakov, N. A.

SOV/76-32-10-9/39

TITLE:

The Cause of the Anticorrosion Effect of Sodium Nitrite on Iron (O prichine antikorroziionnogo deystviya nitrita natriya na zhelezo)

PERIODICAL:

Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 10, pp 2282-2286 (USSR)

ABSTRACT:

To explain the protective effect of sodium nitrite solution the surfaces of iron and steel constructions pre-treated with such solutions were electronographically investigated according to the method devised by I. L. Rozenfel'd, Professor. The electronogram shows an apparently irregular position of the nitrite crystals. It was found, however, that the crystals tend to deposit with their faces parallel to the layer. To answer the question of whether this orientation is caused by some orientation of the layer the author continued the investigations with some data given in publications (Refs 1-4). The surface of iron shows the following layers after the drying of the sodium nitrite solution: 1) Disoriented NaNO_2 crystals. 2) Oriented NaNO_2 crystals. 3) Oriented hexagonal FeOOH crystals.

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SOV/76-32-10-9/39

The Cause of the Anticorrosion Effect of Sodium Nitrite on Iron

4) Oriented rhombic γ -FeOOH crystals. 5) Disoriented crystals of the oxide Fe_3O_4 , and 6) Disoriented iron crystals. Thus, the orientation of the second layer is explained by that of the third. The anticorrosion effect of sodium nitrite is therefore based upon the law of the denser packings as well as on the formation of a multi-layer structure. There are 3 figures, 1 table, and 4 references, 4 of which are Soviet.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii, Moskva (Moscow Institute of Physical Chemistry, AS USSR)

SUBMITTED: May 24, 1957

Card 2/2

PHASE I BOOK EXPLOITATION

SOV/3399

;) Sbishakov, Nikolay Alekseyevich, Valentina Vladimirovna Andreyeva, and
Nina Konstantinovna Andrushchenko

Stroyeniye i mekhanizm obrazovaniya okisnykh plenok na metallakh (Structure and Mechanism of Formation of Oxide Films on Metals) Moscow, AN SSSR, 1959. 194 p. Errata slip inserted. 2,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut fizicheskoy khimii

Resp. Ed.: V.I. Kasatochkin, Doctor of Chemical Sciences; Ed. of Publishing House: A.A. Babad-Zakhryapin; Tech. Ed.: V.V. Bruzgul'.

PURPOSE: The book is intended for students and workers in the field of metallography, particularly those interested in the study of the structure of the surface of metals and the mechanism of their interaction with oxygen.

COVERAGE: Having analyzed the various existing theories on the structure of oxide films on metals, the authors arrived at the conclusion that all existing theories were inadequate and had to be supplemented with new experimental data.

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Structure and Mechanism of Formation (Cont.)

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The main purpose of the book is therefore the systematization of experimental data in this field. Basically, the work presents the investigation of the interaction of metals and pure oxygen or air. Considerable attention has been given to the investigation of the surface of the metal itself, since this knowledge is the prerequisite for a correct understanding of the mechanism of oxide film formation on metal surfaces. Included are 57 tables and 17 photographs. There are 132 references, of which 49 are Soviet.

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Structure and Mechanism of Formation (Cont.)

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SOV/76-33-7-35/40

5(4)

AUTHOR:

Shishakov, N. A.

TITLE:

On the Structure of Germanium Condensed in Vacuum

PERIODICAL:

Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 7,
pp 1662 - 1665 (USSR)

ABSTRACT:

Contrary to silicon, no crystalline but amorphous germanium is prepared by condensation in vacuum on a cold base. Detailed electronoscopic investigations of the latter form were carried out by (Ref 2). A comparison of the data obtained with those of this article (Table 1) shows good agreement. Determinations of the radial atomic arrangement by means of microphotometric treatment of the electronoscopic pictures obtained make it possible here to plot the experimental curves of radial distribution (Figs 3,4) according to the known equation (Ref 3). A comparison of the results with those obtained in the paper (Ref 2) (Table 2) leads to the following conclusions: As the interatomic distances 2.4 and 4.0 Å were observed also in the present case, the explanations of the structure of amorphous germanium given in (Ref 2) may be regarded as correct. The strong maximum at $r = 1.7 - 1.8$ Å, however, cannot be referred to the distance

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On the Structure of Germanium Condensed in Vacuum

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Ge - Ge, but is explained by the presence of oxygen (Ge - O). The second maximum at 1.3 Å can be explained by the presence of molecular oxygen. These results led to the assumption that the structure of condensed germanium depends on the degree of vacuum. Experiments made with a vacuum of 10^{-6} - 10^{-7} torr confirmed this assumption, as in this case crystalline germanium condensed (Table 3) and did not differ in this state from condensed silicon (with respect to the structure). Thus, it was found that the irregular lattice observed in the preceding investigations may be ascribed to the inclusion of oxygen in germanium. There are 4 figures, 3 tables, and 5 references, 3 of which are Soviet.

ASSOCIATION: Akademiya nauk SSSR, Institut fizicheskoy khimii, Moskva (Academy of Sciences of the USSR, Institute of Physical Chemistry, Moscow)

SUBMITTED: February 18, 1959

Card 2/2

~~SHISHAKOV, Nikolay Alekseyevich~~; KITAYGORODSKIY, A.I., doktor fiz.-matem.
nauk, otv. red.; BABAD-ZAKHRYAPIN, A.A., red. izd-va; BRUZGULS, V.V.,
tekhn. red.

[Principles of structure analysis] Osnovnye poniatiia strukturnogo
analiza. Moskva, Izd-vo Akad. nauk SSSR, 1961. 363 p.
(MIRA 14:8)

(Crystallography)

ASANOV, U.A.; SHISHAKOV, N.A.

Mechanism of the interaction of platinum with oxygen at temperatures up to 300°. Izv. AN SSSR. Otd. khim. nauk no.2:225-229 F '61.
(MIRA 14:2)

1. Institut fizicheskoy khimii AN SSSR.
(Platinum) (Oxygen)

SHISHAKOV, N.A.; ANDRUSHCHENKO, N.K.; ASANOV, U.A.

Role played by oxygen in the formation of textures on the surface
of metals. Izv. AN SSSR. Otd.khim.nauk no.7:1234-1240 J1 '61.

(MIRA 14:7)

1. Institut fizicheskoy khimii AN SSSR.
(Metallic oxides)

15 2240

29525
S/062/61/000/011/012/012
B103/B147

AUTHORS: Gorbunov, N. S., Shishakov, N. A., Sadikov, G. G., and Babad-Zakhryapin, A. A.

TITLE: Neutron-diffraction study of titanium carbide and nitride

PERIODICAL: Akademiya nauk SSSR Izvestiya Otdeleniye khimicheskikh nauk, no. 11, 1961, 2093 - 2095

TEXT: The composition of (a) titanium carbide, and (b) titanium nitride was studied at the beginning and the end of their homogeneity ranges. The neutron-diffraction pictures were taken with a remote-control neutron diffractometer (R. P. Ozerov, S. V. Kiselev et al. Kristallografiya 5, No. 2 (1960)). It was positioned on one of the horizontal channels of the NPT-1000 (IRT-1000) reactor of the Institut atomnoy energii Akademii nauk SSSR (Institute of Atomic Energy of the Academy of Sciences USSR). The wavelength of the neutrons which were monochromatized by reflection from the (111) plane of a lead single crystal, was 1.06 Å. The neutrons scattered by the specimen were recorded automatically by means of an 3000-09 (EPF-09) in dependence on the dispersion angle. The relation of Card 1/8

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Neutron-diffraction study of...

the intensities of the individual reflexes (Table) was determined from the relation of the areas below the integral curve of the count intensity with deduction of the background. Fig. 1 shows the neutron-diffraction pictures. They show only the reflexes satisfying the extinction condition for a face-centered cubic lattice. In such a way, the x-ray data on the symmetry of the unit cell of the compounds studied were confirmed by neutron-diffraction data. The absence of superstructure reflexes proves that the nonmetal atoms are distributed statistically in these compounds. The calculated intensity values were found on the

basis of the equation: $I_{calc} \approx F^2 p (1/\sin^2 \theta \cos \theta) A(\theta)$, where F is a structure factor; p is the recurrence factor; and $A(\theta)$ is the absorption factor. In the present case, $A(\theta)$ depends only slightly on the angle θ and was thus not taken into account. It has been found that the calculated intensity values of TiC , $TiC_{0.25}$, and $Ti_{0.5}N$ are in good agreement with the experimental data. In $TiC_{0.25}$ the composition of which is almost stoichiometric, the Ti atoms occupy all possible vacancies. Actually, the nonmetal atoms are in titanium carbide and

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Neutron-diffraction study of ..

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nitride in the octahedral holes. These holes are occupied statistically by titanium carbide which shows a deficiency of carbon. In titanium nitride, the lattice is deficient as to titanium. There are 1 figure, 1 table, and 8 references: 4 Soviet and 4 non-Soviet. The two references to English-language publications read as follows: J. Bacon, Difraktsiya neytronov (Neutron diffraction), IL, M., 1957; Tekhnika vysokikh temperatur (High-temperature Engineering), edited by I. E. Campbell, IL, M., 1959.

ASSOCIATION Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences USSR)

SUBMITTED May 25, 1961

Table Experimental and calculated reflex intensities for titanium carbide and nitride

Legend: (1) titanium nitride; (2) titanium carbide; (3) I_{exp} ; (4) I_{calc} for $Ti_2O_3 \cdot 6H_2O$; (5) I_{calc} for TiC .

Card 3/0

24657

S/076/61/035/006/009/013
B110/B220

1164, 1147, 1418
24,7400 (1055, 1160, 1395)

AUTHORS: Andreyeva, V. V. and Shishakov, N. A. (Moscow)

TITLE: Structure of the surface layers of germanium and silicon based on optical and electron diffraction data

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 6, 1961, 1351 - 1358

TEXT: Since the electrical properties of Ge and Si semiconductors are largely dependent on the reaction products with oxygen and moisture formed at the surface, their surface structure has to be studied thoroughly. The thickness of the nonmetallic surface layer was determined optically by means of a polarization goniometer (V. V. Andreyeva: Tr. In-ta fiz. khimii AN SSSR, vyp. VI, 79, 1957) when the reversible adsorption of oxygen through the surface of condensed germanium was studied. Films of very pure germanium on glass slides were obtained by evaporating Ge from a tungsten coil at 10^{-6} - 10^{-7} mm Hg and measured optically. After introduction of dry air further measurements were made. The thicknesses of the layers obtained from the measuring difference (Fig. 1) show: the true oxide film (I) which is constant in vacuo is covered by a volatile film (II) pre-

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S/076/61/035/006/009/013
B110/B220

Structure of the surface layers...

sumably consisting of molecular oxygen. In the first reaction period only (II) exists, whereunder (I) develops later on (after 34 days on air). When exposed <15 days, the total germanium film was reduced by <5 Å. Presumably the apparent reduction is due to diffusion of Ge atoms into the oxygen layer. After storage on air for 34 days (~50% relative humidity), an oxide layer of 80 Å thickness (Fig. 1) was reduced to 46 Å after 50 hr and to 52 Å after 6 hr of uninterrupted evacuation. This behavior which is typical for genuine metals is due to evaporation of the oxygen surface layer, breakdown of the equilibrium in the oxide film, rediffusion to the metal, etc. Thinner layers were obtained in two tests with pure dry O₂: at the beginning of exposure: 2-3 Å, after 48 hr: 4-6 Å. With (~50% air humidity) the thickness of the film increased to 10-14 Å and then remained constant. It was shown by four independent tests that water steam is not adsorbed on a surface of pure Ge. Only after repeated introduction and evacuation (17 mm Hg) of steam a water adsorption layer of about 3 Å was formed. Furthermore, the adsorption of oxygen on monocrystals was studied: polished Ge and Si samples cut from p-type monocrystals were etched, i.e.

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B110/B220

Structure of the surface layers...

Ge by HF and Si by 3 parts of HNO_3 + 1 part of HF. The film thickness was determined by measuring the ellipticity of the reflected light directly after polishing, after etching, and after different reaction times at room temperature (Table 1). The values are related to the polished surface - 0, thus not absolute, since the surface was already covered by a nonmetallic film. The nature of the film depends on the type of Si and on the etching process. The further change of the film due to atmospheric influence varies with different samples. In the case of Ge the film thickness increases rapidly for 8 days, then the increase is delayed, presumably due to the change of the semiconductor properties of etched Si and Ge. On not-etched polished samples the oxide layer grows with \sqrt{t} . This is explained by diffusion of Ge atoms into the oxygen layer. Probably local corrosion, formation of hydroxide, and further scarcely studied processes occur in the case of etched samples. Furthermore, the reaction with liquid water was studied in detail: Ge vaporized in vacuo upon glass slides was kept in the exsiccator with saturated water steam. After some days the initially black Ge layer became colorless and transparent. "Soluble" GeO_2 formed presumably by condenser water was found by electron diffraction. The intensities and

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B110/B220

Structure of the surface layers...

and spacings found by x-ray studies were similar to those of quartz. Contrary to quartz a marked reduction of the back reflexes and the background was verified for large scattering angles. Moreover, crystalline pure Ge powder obtained by zone melting was introduced into water and the latter vaporized at room temperature. The residue consisted of Ge (discontinuous X-ray reflexes) and the germanium oxide mentioned (continuous reflexes). Several sputtered Ge samples formed thick opaque and easily exfoliating layers due to adsorption of oxygen. Therefrom a white powder developed in water after some months, which could not be identified by radiography (spacings in Table 3). A maximum radial distribution curve corresponds to the distance of $1.9 \pm 0.1 \text{ \AA}$, thus Ge oxide or hydroxide are concerned. A 16% loss in weight at 500°C corresponds to $\text{Ge}(\text{OH})_2$ or $\text{GeO}_2 \cdot \text{H}_2\text{O}$. The side length of the Ge-O-tetrahedron is 3.1 \AA . There are 2 figures, 3 tables, and 15 references: 8 Soviet-bloc and 7 non-Soviet-bloc. The references to English-language publications read as follows: J. B. Gunn, Proc. Phys. Soc., 67 B, 409, 1954. J. T. Low, E. E. François, J. Phys. Chem., 60, 353, 1956; 59, 67, 1955. R. J. Archer, J. Electrochemical Soc., 104, No. 10, 1957.

Card 4/7

24657

S/07.6/61/035/006/009/013

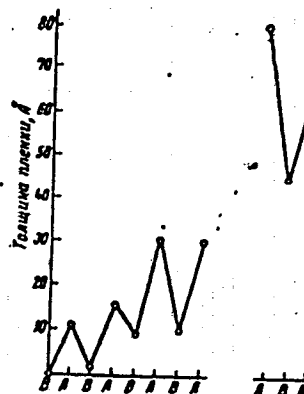
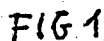
B110/B220

Structure of the surface layers...

ASSOCIATION: Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry AS USSR)

SUBMITTED: October 12, 1959

Fig. 1: Varying thickness of the oxygen film adsorbed on germanium dependent on the surrounding medium: B) vacuum in 6 hr; A) atmospheric influence for 20-30 min. The right part was obtained after 34 days in normal air (~50 % humidity)



Card 5 '7

SHISHAKOV, N.A.; ANDRUSHCHENKO, N.K.

Isomorphism of the peroxides and carbonyls of platinum.
Zhur. fiz. khim. 35 no.7:1593-1599 J1 '61. (MIRA 14:7)

1. Institut fizicheskoy khimii AN SSSR.
(Platinum oxide) (Carbonyls) (Isomorphism)

VOL, Yu.TS.; SHISHAKOV, N.A.

Nature of selective action of a silver catalyst in the reactions
of moderate oxidation. Izv.AN SSSR Otd.khim.nauk no.4:586-591
Ap '62. (MIRA 15:4)

14 Institut fizicheskoy khimii AN SSSR.
(Silver oxides) (Catalysis)

SAKAVOV, I.Ye.; SHISHAKOV, N.A.

Mechanism of interaction of calcium hydroxide with quartz under normal conditions. Izv.AN SSSR Otd.khim.nauk no.4:591-597 Ap '62. (MIRA 15:4)

1. Institut fizicheskoy khimii AN SSSR.
(Calcium hydroxide) (Quartz)

SAKAVOV, I.Ye.; SHISHAKOV, N.A.

Structure of the simplest permutit. Izv. AN SSSR Ser.khim. no.10:
1745-1749 0 '63. (MIRA 17:3)

1. Institut fizicheskoy khimii AN SSSR.

VOL, Yu.TS; SHISHAKOV, N.A.

Equilibrium characteristics of the silver-oxygen system.
Izv. AN SSSR. Ser. khim. no.11:1920-1923 N '63. (MIRA 17:1)

1. Institut fizicheskoy khimii AN SSSR.

SHISHAKOV, N. A.
L 16293-65 EWT(m)/T Pb-4
ACCESSION NR: AP4045793

S/0062/64/000/009/1565/1573

AUTHOR: Dubinin, M. M.; Zhdanov, S. P.; Zhukovskaya, Ye. G.; Murdmaa, K. O.; Polstyanov, Ye. F.; Sakavov, I. Ye.; Shishakov, N. A. *C*

TITLE: Investigation of the adsorption properties and secondary porous structure of adsorbents having molecular sieve functions. Communication 9. Parameters of the elementary crystal cells and adsorption capacity of synthetic type A zeolites *1*

SOURCE: AN SSSR. Izv. Seriya khimicheskaya, no. 9, 1964, 1565-1573

TOPIC TAGS: adsorptive property, secondary porous structure, adsorbent, molecular sieve, elementary crystal cell parameter

ABSTRACT: Experimental data was obtained and calculations were made to evaluate the effect of the a_{0A} parameters of the cubic elementary crystal cells on the volume of the major cavities and on the adsorption capacity of type A zeolite crystals and to attempt to explain the role of the minor cavities in water adsorption by zeolites of this type. In calculating the volume of the major cavities

Card 1/3

L 16293-65

ACCESSION NR: AP4045793

of type A zeolites, based on x-ray structural data, it was necessary to take into account the parameters of the elementary crystal cells (a_{0A}). The following relationships were found to be quite accurate for obtaining values for the volume of the major cavity: $V_{mA} = 200.0a_{0A} - 1688\text{\AA}^3$, or $V_{mA} = 417.9a_{0A} - 4373\text{\AA}^3$. Thus the calculated volume and the experimental adsorption capacity increased noticeably as the elementary crystal cell parameter increased. Experimental data on the equilibrium adsorption of water by NaA crystalline zeolites at 20-100°C and equilibrium relative pressures of 5×10^{-4} - 2×10^{-1} fully confirm the potential theory of adsorption. Approximately 24 water molecules were adsorbed in a major cell of the type A zeolite. Based on its geometry, a minor cavity could contain 2-3 water molecules, but based on experimental data, adsorption of water in previously dehydrated crystals of NaA zeolite takes place only in the major cavity. Thus the role of the minor cavities in water adsorption is still to be established. "The authors thank Ye. N. Yegorov for chemical analysis of the zeolite samples and N. G. Yl'ko for conducting individual experiments." Orig. art. has: 7 tables, 2 figures and 5 equations.

Card 2/3

L 16293-65

ACCESSION NR: AP4045793

2
ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry Academy of Sciences SSSR) ; Institut khimii silikatov Akademii nauk SSSR (Institute of Silicate Chemistry Academy of Sciences SSSR)

SUBMITTED: 29Dec62

ENCL: 00

SUB CODE: GC

NO REF SOV: 004

OTHER: 004

Cord 3/3

~~SHISHAKOV, N. A.~~
L 16157-65 EXT(2)/T Pb-4 SSD/AFNL/AS(mp)-2
ACCESSION NR: AP4045794 S/0062/64/000/009/1573/1580

AUTHOR: Dubinin, M. M.; Zhdanov, S. P.; Zhukovskaya, Ye. G.; Murdmaa, K. O.; Polstyanov, Ye. F.; Sakavov, I. Ye.; Shishakov, N. A.

TITLE: Investigation of the adsorption properties and the secondary porous structure of adsorbents functioning as molecular sieves. Communication 10. Composition, adsorption properties and limiting adsorption volume of type X synthetic zeolites

SOURCE: AN SSSR. Izv. Seriya khimicheskaya, no. 9, 1964, 1573-1580

TOPIC TAGS: type X zeolite, synthetic zeolite, adsorption, porous structure, molecular sieve, isomorphic substitution, elementary cell parameter, adsorption isotherm

ABSTRACT: The effect of varying compositions of the aluminosilicate skeleton of type X synthetic zeolites on the volume of the major cavities and the adsorption properties of the zeolites was determined. In the type X zeolites the $\text{SiO}_2/\text{Al}_2\text{O}_3$ ratio (x) may be varied from 2.2 to 3.3 due to the isomorphic substitution of the

Card 1/3

L 16157-65
ACCESSION NR: AP4045794

3

Al ions by Si ions. The parameter of the cubic elementary crystal cell was determined from x-ray data; the radius of the structural unit corresponded to the relationship $r_x = 6.406 - 0.060(x-2.00)$, with x varied from 2.2 to 3.3. Thus the volume of the major cavity decreased as the zeolite was enriched in Si, but the number of elementary cells per unit mass of dehydrated zeolite increased. The volume of the major cavities per unit mass of crystals was practically independent of the zeolite composition. The adsorption isotherms and the limiting adsorption volumes for NaX zeolites were determined for water, benzene, n-pentane, cyclohexane and pyridine at 20C and for nitrogen at -196C. The limiting adsorption volume of the zeolites for H₂O and N₂ was also practically independent of the NaX zeolite composition, and corresponded to the calculated values of the major cavities. Under low equilibrium pressures the adsorption of the dipolar and quadrupolar molecules (water and nitrogen) decreased proportionally to the enrichment of the NaX zeolite with Si; this was attributed to the decreasing number of ion exchange cationites in the cavities due to substitution of Si for NaAl in the aluminosilicate skeleton. "The authors thank Ye. N. Yegorov for chemical analysis of the zeolites. B. A. Lipkind for supplying zeolite sample and N. G. Ul'ko for

Card 2/3

L 10157-65

ACCESSION NR: AP4045794

2

conducting individual tests. Orig. art. has: 5 tables, 2 figures and 4 equations

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry Academy of Sciences SSSR); Institut khimii silikatov Akademii nauk SSSR (Institute of Silicate Chemistry Academy of Sciences SSSR)

SUBMITTED: 29Dec62

ENCL: 00

SUB CODE: GC, GP

NO REF SOV: 006

OTHER: 000

Card 3/3

1. T = 27
2. 1275-1277

Author: Fonti, A. A.; Shishakov, N. A.

1. Determination of the position of cations in synthetic T zeolite¹ (erionite)

2. AN SSSR. Izvestiya. Seriya khimicheskaya, no. 7, 1965, 1275-1277

3. zeolite, crystal structure analysis

The structure of synthetic erionite was studied by means of its X-ray diffraction pattern. The line intensities of the pattern were determined visually and were expressed in numbers on the Berna nine-point scale. From these intensities, the experimental amplitudes F_o were calculated; the theoretical amplitudes F_c were calculated on a computer. The agreement between the two sets of values was good. The electron density was calculated by the Fourier method. The electron density, expressed in absolute values, is shown in fig. 1 of the enclosure. The maximum of the electron density at the origin of the coordinates at point 1, 2 corresponds to the electron density of two calcium and two potassium atoms. The maximum at point 3 probably corresponds to the electron density of sodium. The maxi-

Card 1/1

64171-65

ACCESSION NR: AP5019779

Fig. 1 corresponds to the electron density of four silicon atoms, and at the same time to the electron density of four oxygen atoms. The Ca^{2+} cation is thought to be located at the center of a small hexagonal prism, and at the center of a small cavity. The electron density of the large cavity, then, the following coordinates were assigned:

0.000,	0.000,	0.000,
0.333,	0.666,	0.250,
0.000,	0.000,	0.250

Orig. art. has: 2 figures, 2 tables.

CITATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry, Academy of Sciences SSSR)

28 Oct 64

ENCLOSURE 01

SUB CODE: IC, SS

Card 2/3

L 64171-65

ACCESSION NR: AP5019779

ENCLOSURE: 01

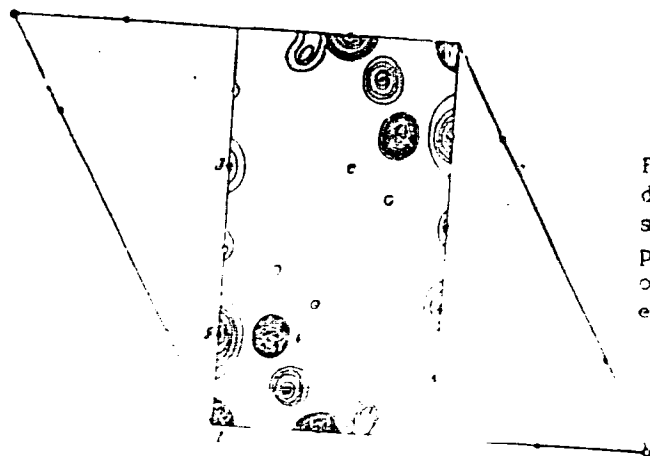


Fig. 1. Projection of electron density distribution in the structure of erionite on the 001 plane. Negative density values on white areas of the map do not exceed $7 \text{ e}/\text{\AA}^3$.

Card 3/3

SADIKOV, G.G.; SHISHAKOV, N.A.

X-ray and neutron diffraction study of sodium tungstate. Izv. AN SSSR.
Ser. khim. no.7:1277-1278 '65. (MIRA 18:7)

1. Institut fizicheskoy khimii AN SSSR.

GLONTI, O.A.; TSITSISHVILI, G.V., akademik; SHISHAKOV, N.A.

Arrangement of silver ions in zeolite AgX. Dokl. AN SSSR
164 no.2:368-370 S '65. (MIRA 18:9)

1. Institut fizicheskoy khimii AN SSSR. 2. AN GruzSSR (for
TSitsishvili).

L 22071-66 EWT(m)/EPF(n)-2/T/EWP(t) IJP(c) JD/WM/JG
ACC NR: AP6008050

SOURCE CODE: UR/0020/66/166/004/0880/0882

AUTHOR: Kuleshov, I. M.; Shishakov, N. A.; Kavtardze, N. N.; Sokolova, N. P. 32

ORG: Institute of Physical Chemistry, Academy of Sciences SSSR (Institut fizi-
cheskoy khimii Akademii nauk SSSR) B

TITLE: Study of the structural transformations of UO_2 under the influence of high temperature and zirconium or thorium dioxide admixtures

SOURCE: AN SSSR. Doklady, v. 166, no. 4, 1966, 880-882

TOPIC TAGS: zirconium compound, thorium compound, uranium compound

ABSTRACT: The effect of ZrO_2 and ThO_2 admixtures and thermal pretreatment on the properties and structure of uranium dioxide was studied on samples prepared by co-precipitating the hydroxides, reducing to UO_2 , grinding into a powder and pressing into pellets, then hardening and quenching. The transformations taking place were observed by chemical and spectral (x-ray and infrared) methods. It is shown that thermal hardening of pressed UO_2 in the presence of small amounts of ZrO_2 or ThO_2 at high temperatures (1600°C) causes an increase in its crystal lattice parameters

Card 1/2

UDC: 541.66

L 22071-66

ACC NR: AP6008050

and changes in the absorption bands in the infrared spectra. These structural changes also substantially affect the vaporization of UO_2 . The latter is decreased by the presence of ZrO_2 and ThO_2 . The paper was presented by Academician V. I. Spitsyn on 3 Jun 3 1965. Orig. art. has: 3 tables.

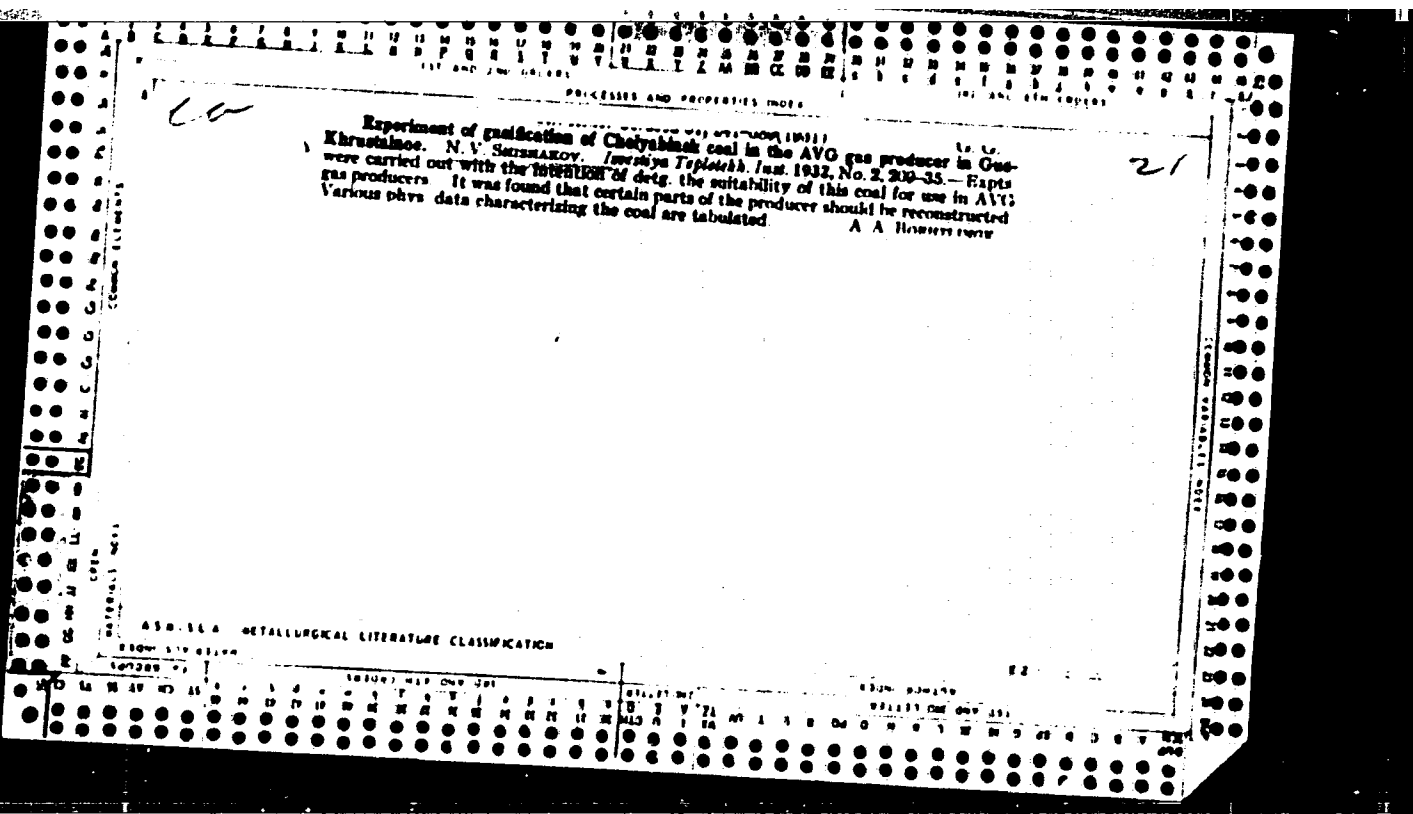
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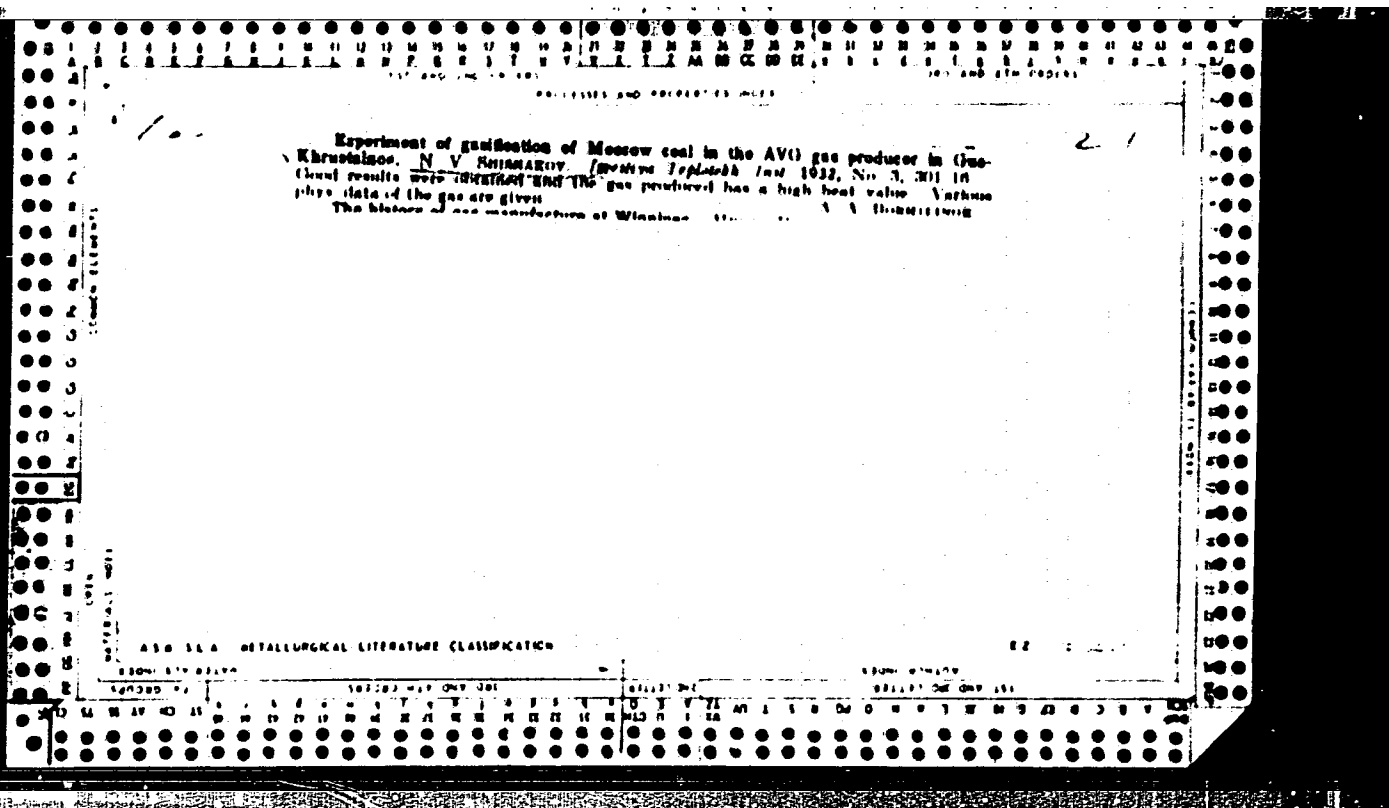
SUBM DATE: 03Jun65/

ORIG REF: 004/

OTH REF: 003

Card 2/2 *llh*





DA

EXPERIMENTS WITH GASIFICATION OF DONETS ANTHRACITES IN THE THOMSON GAS PRODUCER.
N. V. SHUMAROV. *Izvestiya Tekhnicheskogo Instituta* 1932, 391-407. The performance of the Thomson gas producer was quite satisfactory. However, anthracite containing more than 1% of ash would not be suitable on account of clinkering; this difficulty can be met by introducing a water jacket around the zone of combustion. Anthracite from various mines was tested and the performance is reported in detail. A. A. BORTLINCK.

21

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

21

Gasifying the Bokovo-Khrustal'msk anthracite "AK" in Thiesen gas producer.
 N. V. SUMHAROV, *Izvestiya Vsesoyuzn. Inst. 1932, 1000 (R)*—The analysis of the coal
 was: (percentage by weight) H₂O 8.95%, ash 9.19%, total S 1.94%, C 70.89%, H₂
 1.84%, O₂ + N₂ (by difference) 1.18%. The heating value of the coal amounted to
 7555 kg. cal., the yield of dry gas on the dry fuel 4.37 cu. m. per kg., its compn :
 (by vol.) C₂H₄ 2.18%, unsatd. compds. (C₂H₂) 0.2%, O₂ 0.25%, CO 31.87%, H₂ 9.15%,
 CH₄ 1.13%, H₂S 0.13%, N₂ (by difference) 55.09%, its heating value 1396 cal. per cu. m.
 A. A. BOBTLINIK

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

62-2

transferring Chelyabinsk coal in a mixer gas producer N. V. Shishakov. *Izvestiya
Teploelektr. Inst.* 1933, No. 4, 47-57; cf. C. A. 26, 11461. The operation of the gas pro-
ducer on the above coal is described. A. A. Bozhilovsk

ASB S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

1930-1939

1940-1949

1950-1959

1960-1969

1970-1979

20

21

Mixed producer gas and gas prepared by steam oxygen treatment of Sulyukta coal. N. V. Shishakov, *Khim. Tverdogo Topliva* 8, 380-401(1967). The physicochem. properties of Sulyukta coal and the exps. described showed its applicability for the prepn. of gas by means of treatment with the steam-O and the steam-air mists. Deterioration of the coal during storage limits its utilization to the region near the deposit. The coal is thermally unstable and, decomg. in the gasification zone, creates high hydraulic resistance. Gasification by treatment with steam-O mist proceeds much more quietly and easily than that with steam-air mists. The calorific value of the gas obtained with the steam-air mist. is 1320-1487 cal., and that with the steam-O mist. 2375-2400 cal. The methods are described and data are tabulated.

A. A. Bulgakov

ASH SLA METALLURGICAL LITERATURE CLASSIFICATION

SHISHAKOV, N. V., KANTOROVICH, B. V., CHERNYSHEV, A. B.

~~##~~ The Conversion of Internal Combustion Engines into Gas Generators (from the
institute—Power Engineering Inst. im G. M. Krzhizhanovskiy) 20/ 1945, p7-8.

SHISHAKOV, N. V.

Principles of Mine Gas Production, published in 1948

~~2/ Jul 49, p1130~~

~~70/~~ Referaty Nauchnykh Rabot za 1943 g., Otdeleniye Tekhnicheskikh Nauk, Moscow-
Leningrad, 1945 U.

~~2/~~ Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, Moscow, U.

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1ST AND 2ND LETTERS													3RD AND 4TH LETTERS												
FACTORIES AND PROPERTIES INDEX																									
<p>ca</p> <p>Generating producer gas. N. V. Shishakov. <i>Vestnik Inzhenerov i Tekh.</i> 1947, No. 1, 23-7. - A review of producer-gas practices in U.S.S.R. and other countries. A gas of 4100-4200 kcal. per cu. m. was obtained from the Moscow-region coal in a high-pressure producer. A datum sheet of these expts. is given. M. Hosh</p> <p>21</p>																									
ASB-55.4 METALLURGICAL LITERATURE CLASSIFICATION																									
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SHISHAKOV, N.V., professor.

Fuel supply for gas power installations. Biul.Kom.po gazosil.nst.
no.2:9-17 '47. (MLRA 9:12)

1.Energeticheskiy institut Akademii nauk SSSR.
(Fuel) (Gas producers)

SHISHAKOV, N. V.

"The Principles of the Production of Fuel Gases (Osnovy Proizvodstva Goryuchikh Gazov) Gos. Energetich. Izd-vo (Publications of State Power Engineering) 1948.

*Also in Scientific Academy Nauk SSSR, Otdel. Tekh. Nauk,
Moscow U. 1949
July 1949 P. 1130*

Smishakov, L. V.

Smishakov, L. V. "Classification of semi-processed and pulverized peat," In symposium:
Tort' y vopr. Khim.-y Belorus. SSR, Minsk, 1948, p. 90-101

So: U-3566, 15 March 53, (Latopis 'Zhurnal Vykh Statey, No. 13, 1949)

USSR/Academy of Sciences
Engineering Sciences

Jul 49

"Annotations on Works of Academicians and Corresponding Members of the Academy of Sciences and Other Scientific Collaborators of the Department of Technical Sciences of the Academy in 1949" 2 pp

"Iz Ak Nauk SSSR, Otdel Tekh Nauk" No 7

Includes annotations on Ya. M. Chervonenkis' "Direct Current Power Transmission," and N. V. Shishakov's "Fundamental Principles in the Production of Combustible Gases."

52/49T4

SHISHAKOV, N. V., TAYTS, YE. M. and TITOV, N. G.

"Methods for the Evaluation of Coals as Raw Material for Industrial Purposes"
(Metody Otsenki Iskopyaemykh ugley dlya promishlennovo ispol'zovaniye).
Ugletekhizdat, 1949.

F F

5793. PRINCIPLES OF PRODUCTION OF FUEL GASES. (OENOVY FIZIKAL'NOYE
GORYUCHIYE GAZOVY). Shishakov, N.V. (Moscow: 1954, G. z. Emery. Izdat.;
extracts in Paliva (Fuel), 1951, vol. 31: May-June, 169-172, July, 198-201).
The first extract gives a short account of the development of underground
gasification in the U.S.S.R.; the second describes Soviet methods of
gasification of solid fuels.

CHERNYSHEV, Andrey Borisovich; LAVROV, N.V., doktor tekhnicheskikh nauk, otvetstvennyy redaktor; PANDEROV, I.L., doktor tekhnicheskikh nauk, redaktor; SHISHAKOV, N.V., doktor tekhnicheskikh nauk, redaktor; AL'TSHULER, V.S., doktor tekhnicheskikh nauk, redaktor; IVANOV, V.M., kandidat tekhnicheskikh nauk, redaktor; PITIN, R.N., kandidat tekhnicheskikh nauk, redaktor; KLIMOV, V.A., redaktor izdatel'stva; SOMOROV, B.A., tekhnicheskiiy redaktor

[Selected works] Izbrannye trudy. Moskva, Izd-vo Akademii nauk SSSR, 1956. 368 p. (MLRA 9:8)

1. Chlen-korrespondent AN SSSR (for Chernyshev)
(Coal gasification)

1. 9000* Problem of Centralized Gas Supply on the Basis of
the Complex Gas-Chemical Utilization of a Solid Fuel and the

Gas Obtained. K voprosu o tsentralizovannom ~~vyosnasheni~~
nii na osnove kompleksnogo gazo-khimicheskogo ispol'-
zovanii tverdogo topliva i potrichaemogo gaza. (Russian.)
N. V. Shishakov. *Gazovaya Promyshlennost'*, 1956, no. 3, Mar.
1956, p. 18-19.

Use and qualitative characteristics of brown coal. Production
of gas for the manufacture of chemical products. Cleansing gas
of resins and S compounds. Synthesis of chemical products from
CO and water with CH_4 and other gases.

ILEK, Yaromir [Jilek, Jaromir]; ZHUKOV, A.A., inzhener [translator];
SHISHAKOV, N.V., doktor tekhnicheskikh nauk, redaktor; KLEYMENOVA,
K.F., vedushchiy redaktor; MARTYNOVA, M.P., vedushchiy redaktor;
POLOSINA, A.S., tekhnicheskiiy redaktor

[New methods of gasification of fuel by oxygen. Translated from the
Czech] Novye sposoby gasifikatsii topliva kislorodom. Perevod s
cheshskogo A.A.Zhukova, pod red. N.V.Shishakova. Moskva, Gos.nauchno-
tekhn. izd-vo nef. i gorno-toplivnoi lit-ry, 1957. 362 p. (MLRA 10:9)
(Gas producers) (Coal gasification)

LANIN, V.A., doktor khim.nauk, red. [deceased]; LOZOVY, A.V., doktor khim.
nauk, red.; ~~SHISHAKOV, N.V.~~, doktor khim.nauk, red.; BANKVITSER, A.L.,
red.; KISELEVA, A.A., tekhn.red.

[Chemical treatment of fuel; proceedings of the conference]
Khimicheskaya pererabotka topliva; trudy soveshchaniia. Moskva,
Izd-vo Akad.nauk SSSR, 1957. 430 p. (MIRA 11:1)

1. Vsesoiuznoye soveshchaniye po probleme iskusstvennogo zhidkogo
topliva i tekhnologicheskikh gazov. 2d, Moscow, 1954.
(Fuel) (Chemistry, Technical)

30V/81-59-5-16818

Translation from: Referativnyy zhurnal, Khimiya, 1959, Nr 5, p 454 (USSR)

AUTHOR: Shishakov, N.V.

TITLE: The Problems of the Production of Industrial Gas¹¹

PERIODICAL: V sb.: Khim. pererabotka topliva. Moscow, AS USSR, 1957,
pp 291 - 308

ABSTRACT: Light is thrown on the present state and prospects for the development of the production of industrial gas from various kinds of raw material. Problems requiring further scientific investigation are listed.

G. Bonvech

Card 1/1

Shishakov, N.V.
AUTHORS: Al'tshuler, V.S. and Shishakov, N. V.

65-7-1/14

TITLE: A Complex Gas-chemical Utilisation of Coals as a Basis of a Centralised Supply of Gas for the Eastern Regions of the USSR (Kompleksnoye gazokhimicheskoye ispol'zovaniye ugley kak osnova tsentralizovannogo gazosnabzheniya vostochnykh rayonov SSSR)

PERIODICAL: Khimiya i Tekhnologiya Topliva i Masel, 1957, No.7, pp. 1 - 15 (USSR)

ABSTRACT: Various schemes for the gasification of Siberian brown coals mined by open-cast methods (high pressure, fluidised bed and blast furnace process) with simultaneous utilisation of some of the gas components for synthesis, for the purpose of a centralised supply of gas for the Eastern regions of the USSR, are discussed and an experimental investigation of semi-coking of ITATSK coals and gasification of semi-coke under pressure up to 30 atm. is described. Data on the ITATSK brown coals are given in Table 1, mean data on the yield and quality of semi-coke and the composition of gas in Tables 2 and 3, respectively. Semi-coking was carried out using a stream of nitrogen-steam mixture (50% N₂, 50% H₂O). The method and apparatus used were described in Ref.2. Gasification of semi-

Card1/2

65-7-1/14

A Complex Gas-chemical Utilisation of Coals as a Basis of a Centralised Supply of Gas for the Eastern Regions of the USSR.

coke was carried out according to the method described in Ref.3; the experimental results are given in Tables 4 and 5. The results obtained indicated the suitability of the ITATSK brown coals for high-pressure gasification, as well as providing approximate technological indices of the process. On the example of ITATSK coals, the economy of the production of gas of high calorific value by the gasification of solid fuel according to the following three schemes is discussed: 1) gasification under high pressure; 2) gasification under high pressure with simultaneous synthesis of hydrocarbons and 3) gasification under high pressure with simultaneous synthesis of ammonia.

G.S. Shafir and S.A. Feygin participated in this work.
There are 11 tables and 3 Russian references.

ASSOCIATION: IGI

AVAILABLE: Library of Congress
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KISLYKH, V.I.; SHISHAKOV, N.V.

Gasification of carbon with steam in the presence of catalysts.

Gaz.prom. no.10:7-11 0 '57.

(MIRA 10:10)

(Coal gasification)

(b)

DATE: 10/10/2001

Plasma/lymphoid Antibody Titers (antibody titer = reciprocal of highest dilution giving a positive result)

and services being provided under materially favorable circumstances (based on the involvement of the individual in the BUREAU of Prisons and on the All-American Conference) in New York, New York, 1958. 45 p. 3,000 copies printed.

Miss A. B. Hunter, R. 2, Tullahoma, T. A. Henderson, D. A. Evans, T. L. Popper,
V. L. Smith, T. L. Roberts, P. A. Smart, A. S. Williams, J. E. Koss, M. A.
E. L. Reynolds and E. L. Williams, S. A. M. J. R. A. Smith,
Miss A. B. Hunter, R. 2, Tullahoma, T. A. Henderson, D. A. Evans,
V. L. Smith, and T. L. Roberts.

REMARKS: The book is intended for specialists engaged in the production and gathering of natural gas, the extraction of gas from coal and shales, the conversion and operation of trunk gas pipelines, gas supply to cities, and the processing of gas.

concerns. The authors review the basic trends in the development of the main gas industry, the prospects for the application of new gas deposits, the construction of solid fuels, the growth of the utilization of natural gas, the construction of gas field operations, the utilization of gas wells, and the utilization of gas in the chemical industry. They further discuss the possibilities of the application of refrigeration, the experience gained in the utilization of gas in the chemical industry, the utilization of gas in the power and underground gas storage facilities. There are no references.

100-438746

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287	Almond, J. R., Jr. Some Economic Problems in the Chemical Conversion of Natural Gas	
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Exhibit 100-1

гаврилова А.А.
GAVRILOVA, A.A.; SHISHAKOV, N.V.

Investigating the reduction phase in the continuous steam-
iron method for the manufacture of hydrogen. Khim i tekhn. topl.
i masel 3 no.3:63-70 Mr '58. (MIRA 11:3)

1. Institut goryuchikh iskopayemykh im. G.M. Krzhizhanovskogo
AN SSSR.

(Hydrogen) (Iron oxides) (Reduction, Chemical)

Shishakov, N.V.
11(2,7)

PHASE I BOOK EXPLOITATION

SOV/2416

Gazosnabzheniye vostochnykh rayonov SSSR na osnove gazifikatsii tverdykh topliv (Supplying the Eastern Regions of the USSR With Gas Produced by Solid Fuel Gasification) Moscow, Gostoptekhizdat, 1959. 214 p. 2,000 copies printed.

Ed.: N.V. Shishakov, Doctor of Technical Sciences; Executive Ed.: T. D. Yefremova; Tech. Ed.: A.V. Trofimov.

PURPOSE: This collection of articles is intended for designing, planning, and scientific research personnel, as well as for engineers, technicians, and students specializing in solid fuel gasification.

COVERAGE: This collection of articles describes the problem of supplying the eastern regions of the USSR with synthetic gas derived from the gasification of solid fuels to overcome that area's lack of natural gas. Individual articles discuss the distribution of the region's coal deposits, the quality and types of coal encountered, gasification process, and the economics involved in the production and supply of the synthetic gas product. The author thanks V.S. Al'tshuler, Doctor of Technical Sciences. References accompany each article.

Card 1/4

Supplying the Eastern Regions of the USSR (Cont.)

SOV/2416

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